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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,200	08/29/2001	Eugene P. Marsh	150.0064 0102	8194
26813	7590	08/31/2004	EXAMINER	
MUETING, RAASCH & GEBHARDT, P.A. P.O. BOX 581415 MINNEAPOLIS, MN 55458			NGUYEN, JOSEPH H	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 08/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/942,200

Applicant(s)

MARSH, EUGENE P.

Examiner

Joseph Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 23-39 and 41-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-39 and 41-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 23-39, 41-48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 23, 27, 30, 32-34, 37, the term "platinum (x): ruthenium" is not supported by the originally filed disclosure and hence is deemed to be new matter. Note that the originally filed disclosure only recites "platinum (x): ruthenium (1-x).

Claims 24-26, 28-29, 31, 35-36, 38-39, 41-48 are also rejected due to their dependency upon the rejected base claims above.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 23-24, 26-39, 41-48, as best understood, are rejected under 35

U.S.C. 102(e) as being anticipated by Dornfest et al.

Regarding claim 23, Dornfest at el. discloses on figure 2 a semiconductor device structure, the structure comprising a substrate assembly 31 including a surface; and a chemical vapor deposited barrier layer 50 over at least portion of the surface, wherein the barrier layer 50 is formed of a platinum (X): ruthenium alloy, where X is in the range of about 0.60 to 0.995 (col. 5, lines 15-28).

Regarding claim 24, Dornfest at el. discloses on that X is in the range of about 0.90 to about 0.98 (col. 5, lines 25-27).

Regarding claim 26, Dornfest at el. discloses on figure 2 the portion of the surface is a silicon-containing surface.

Regarding claim 27, Dornfest at el. discloses on figure 2 a capacitor structure comprising a first electrode 38; a dielectric material 40 on at least a portion of the first electrode; and a second electrode 36 on the dielectric material, wherein at least one of the first and second electrode comprises a chemical vapor deposited barrier layer 50 of platinum (X): ruthenium alloy.

Regarding claim 28, Dornfest at el. discloses that X is in the range of about 0.60 to about 0.995 (col. 5, lines 15-28).

Regarding claim 29, Dornfest at el. discloses that X is in the range of about 0.90 to about 0.98 (col.5, lines 25-27).

Regarding claim 30, Dornfest at el. discloses on figure 2 at least one of the first electrode and second electrode comprises the barrier layer 50 of platinum (X): ruthenium alloy and one or more additional conductive layers 48, 46, 44.

Regarding claim 31, Dornfest at el. discloses on figure 2 the one or more additional conductive layers 48, 46, 44 are formed from materials selected from the group of metals and metal alloys; metal and metal alloy oxide; metal nitrides and metal silicides.

Regarding claim 32, Dornfest at el. discloses on figure 2 a memory cell structure comprising a substrate assembly including at least one active device 31; and a capacitor formed relative to the at least one active device, the capacitor comprising at least one electrode 38 including a chemical vapor deposited barrier layer 50 formed of platinum (X): ruthenium alloy.

Regarding claim 33, Dornfest at el. discloses on figure 2 the capacitor includes a first electrode 38 formed relative to a silicon containing region of the at least one active device; a dielectric material 40 on at least a portion of the first electrode; and a second electrode 36 on the dielectric material, wherein the first electrode comprises the barrier layer 50 formed of platinum (X): ruthenium alloy.

Regarding claim 34, Dornfest at el. discloses on figure 2 the first electrode 38 comprising the barrier layer 50 formed of platinum (X): ruthenium alloy includes one or more additional conductive layers 48, 46, 44.

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Regarding claim 35, Dornfest at el. discloses that X is in the range of about 0.60 to about 0.995 (col. 5, lines 15-28).

Regarding claim 36, Dornfest at el. discloses that X is in the range of about 0.90 to about 0.98

Regarding claim 37, Dornfest at el. discloses on figure 2 an integrated circuit structure comprising a substrate assembly 31 including at least one active device 31; and an interconnect 38 formed relative to the at least one active device, the interconnect including a barrier layer 50 formed of platinum (X): ruthenium alloy.

Regarding claim 38, Dornfest at el. discloses that X is in the range of about 0.60 to about 0.995 (col. 5, lines 15-28).

Regarding claim 39, Dornfest at el. discloses that X is in the range of about 0.90 to about 0.98.

Regarding claim 41, Dornfest at el. discloses on figure 2 the at least a portion of the surface defines a small high aspect ratio opening.

Regarding claim 42, Dornfest at el. discloses that a thickness of the barrier layer 50 is in a range of about 10A to about 10,000A (col. 6, lines 5- 7).

Regarding claim 43, Dornfest at el. discloses that the thickness of the barrier layer is in a range of about 100A to about 500A (col. 6, lines 5-7).

Regarding claim 44, Dornfest at el. discloses on figure 2 the substrate assembly 31 comprises at least one active device.

Regarding claim 45, Dornfest at el. discloses that the barrier layer 50 comprises a chemical vapor deposited barrier layer (col. 9, lines 43-44).

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Regarding claim 46, Dornfest at el. discloses on figure 2 the substrate assembly comprises a small high aspect ratio opening, and further wherein the interconnect is formed in the small high aspect ratio opening relative to the at least one active device.

Regarding claim 47, Dornfest at el. discloses that a thickness of the barrier layer 50 is in a range of about 10A to about 10,000A.

Regarding claim 48, Dornfest at el. discloses that the thickness of the barrier layer is in a range of about 100A to about 500A.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 25, 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dornfest et al. as applied to claims 23 and 37 above.

Regarding claims 25 and 49, Dornfest at el. disclose substantially all the structure set forth in the claimed invention except X being about 0.95. However, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify Dornfest at el. by having X being about 0.95 for the purpose of improving the performance of the semiconductor device, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

***Response to Amendment***

The declaration filed on 03/29/2004 under 37 CFR 1.131 has been considered but is ineffective to overcome the Dornfest et al reference.

The evidence submitted is insufficient to establish a reduction to practice of the invention in this country or a NAFTA or WTO member country prior to the effective date of the Dornfest et al reference. From Exhibit A, it appears that platinum (x) wherein x is in the range of about 0.60 to about 0.995, the composition of ruthenium is not in the range of about 0.40 to about 0.005 in order to form the platinum: ruthenium alloy as recited in the claimed invention. Note that the composition of ruthenium never reaches 0.2 in Exhibit A. As such, Exhibit A does not correspond nor support the claimed invention or the originally filed disclosure.

***Response to Arguments***

Applicant's arguments with respect to claims 23-39, 41-49 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



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A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (703) 308-1269. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 308-7382 for regular communications.

JN  
August 26, 2004



**JEROME JACKSON**  
PRIMARY EXAMINER